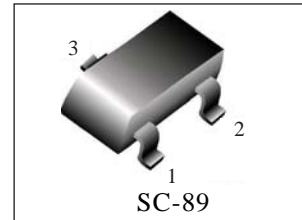


Digital transistors (built-in resistors)

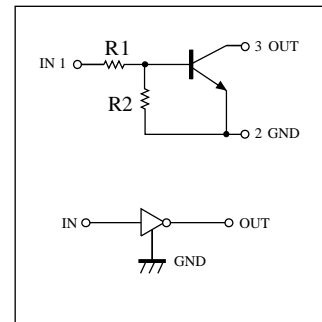
• **Features**

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- 3) Only the on/off conditions need to be set for operation, making device design easy.



• **Device Marking and Ordering Information**

Device	Marking	Shipping
DTC502T1G	8A	3000/Tape&Reel
DTC502T3G	8A	10000/Tape&Reel



• **Absolute maximum ratings** ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-10~+40	V
Output current	I_O	50	mA
	$I_{C(Max)}$	100	
Power dissipation	P_d	150	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55~+150	$^\circ\text{C}$

• **Electrical characteristics** ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	-	-	0.5	V	$V_{CC} = 5V, I_O = 100\mu A$
	$V_{I(on)}$	3	-	-		$V_O = 0.3V, I_O = 2mA$
Output voltage	$V_{O(on)}$	-	-	0.3	V	$I_O/I_I = 10mA/0.5mA$
Input current	I_I	-	-	0.88	mA	$V_I = 5V$
Output current	$I_{O(off)}$	-	-	0.5	μA	$V_{CC} = 50V, V_I = 0V$
DC current gain	G_I	30	-	-	-	$V_O = 5V, I_O = 5mA$
Input resistance	R_1	7	10	13	k Ω	-
Resistance ratio	R_2/R_1	0.8	1	1.2	-	-
Transition frequency	f_T	-	250	-	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$ *

* Transition frequency of the device

• Electrical characteristic curves

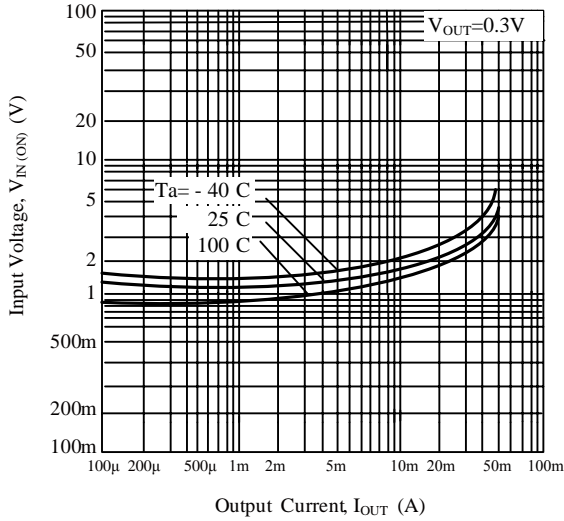


Fig.1 Input Voltage vs. Output Current (ON Characteristics)

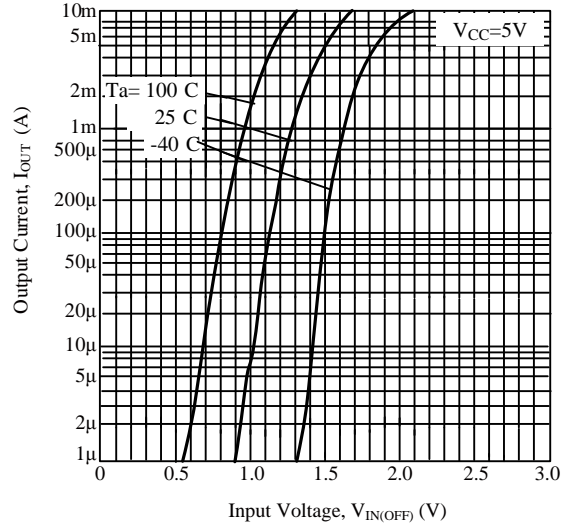


Fig.2 Output Current vs. Input Voltage (OFF Characteristics)

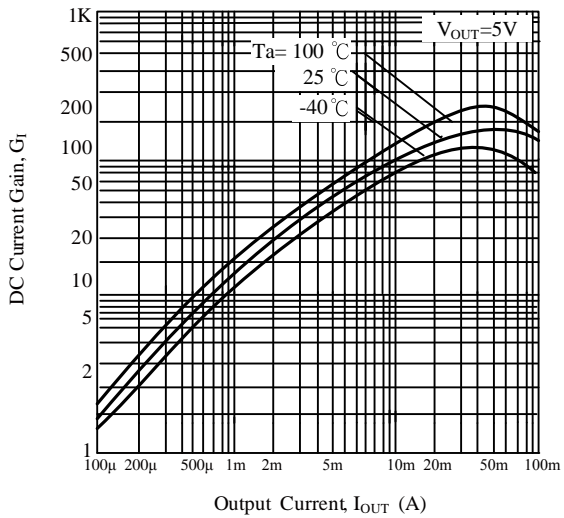


Fig.3 DC Current Gain vs. Output Current

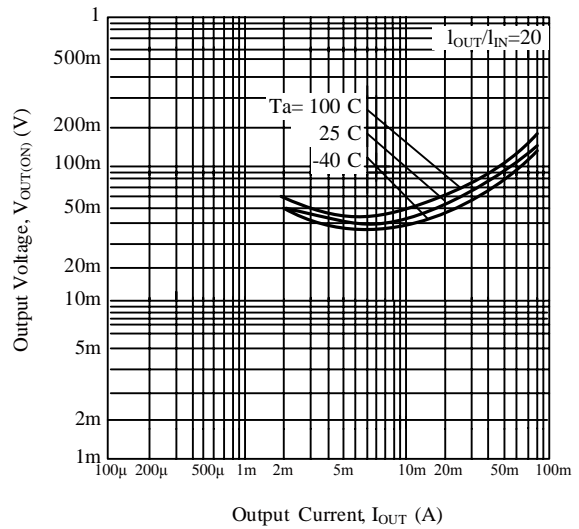
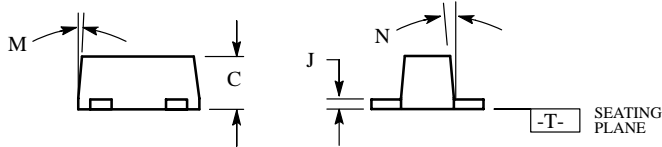
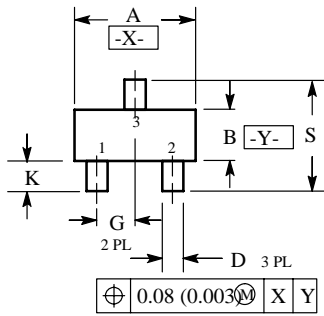


Fig.4 Output Voltage vs. Output Current

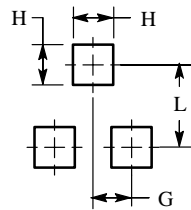
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NOTES:

- 1 DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982
- 2 CONTROLLING DIMENSION: MILLIMETERS
- 3 MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
- 4 463C-01 OBSOLETE, NEW STANDARD 463C-02

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.50	1.60	1.70	0.059	0.063	0.067
B	0.75	0.85	0.95	0.030	0.034	0.040
C	0.60	0.70	0.80	0.024	0.028	0.031
D	0.23	0.28	0.33	0.009	0.011	0.013
G	0.50 BSC			0.020 BSC		
H	0.53 REF			0.021 REF		
J	0.10	0.15	0.20	0.004	0.006	0.008
K	0.30	0.40	0.50	0.012	0.016	0.020
L	1.10 REF			0.043 REF		
M	---	---	10 °	---	---	10 °
N	---	---	10 °	---	---	10 °
S	1.50	1.60	1.70	0.059	0.063	0.067



RECOMMENDED PATTERN OF SOLDER PADS